Paper No. 32

DETERMINATION OF CATION AND ANION CONCENTRATIONS IN TOBACCO AND CIGARETTE SMOKE.

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ABSTRACT

Ion exchange techniques have been applied to tobacco and cigarette smoke to determine cation and anion concentrations. An aliquot from the water extract of the tobacco sample was passed through a cation exchange resin and titrated with standard base. Another aliquot was passed through an anion exchange resin and titrated with standard acid. Smoke was collected from five cigarettes smoked 47 mm each. The cigarettes were smoked on a machine designed to take a 35 cc puff of 2 second duration once each minute. One sample was collected in excess base, passed through a cation exchange resin, freed from CO_2 and titrated with standard base. Another sample was collected in standard acid, passed through an anion exchange resin and titrated with standard acid. In all cases, the number of equivalents of standard base is equal to the number of equivalents of anion present and the number of equivalents of standard acid is equal to the number of equivalents of cation present. Details of the methods and typical results for tobacco and cigarette smoke will be given.

REVIEW BY H. C. SILBERMAN

The titration curves are very flat, which is characteristic for highly buffered solutions. The titration method was tried out first on synthetic samples containing known amounts of acids, neutrals, and bases. Phenols were not used in synthetic mixtures because they are present only in very small amounts in tobacco smoke.

The tobacco samples were blended with water in a Waring Blendor. The tobacco cations and anions were titrated separately. A result is shown below:

Tobacco Sample	m. eq. Cation/gm	m. eq. Anion/gm
No. 1	2.990	2.539
No. 2	2.914	2.427
Average	2.952	2.483

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Source: https://www.industrydocuments.ucsf.edu/docs/gkik0000

Various results for tobacco and smoke analyses were given, but the samples were never defined other than by a code.

The author felt that his method is simple and gives good data in a reasonable amount of time.

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Source: https://www.industrydocuments.ucsf.edu/docs/gkik0000